REMARKS/ARGUMENTS

The specification has been amended in order to clarify certain portions of the text. Claims 1-15 remain pending and new claims 16-31 have been added. No new matter has been added and examination of the amended patent is hereby respectfully requested.

In addition, it is noted that new claims 16-31 have been presented in a form to clarify that certain elements of each of the independent apparatus and method claims are provided merely for (a) identifying the purpose or intended use and/or (b) antecedent basis. Only elements of the apparatus recited in the body of the respective independent claims have been recited for the purpose of defining the claimed invention. In other words, the elements of the independent apparatus and method claims that have been presented in the preamble of the respective claims (i.e., before "the method comprising" or "the claimed apparatus comprising") have been recited merely for the purpose of identifying the intended use of the apparatus or method and/or for providing antecedent basis for limitations recited in the body of the respective claims. Thus, in accordance with MPEP 2111.02, elements or steps recited in the respective preambles are not intended to define structural limitations and/or method steps that define the scope of the present inventive claims, because the preambles of the respective claims are not "necessary to give life, meaning and vitality" to the independent claims.

In addition to presenting broadened claims, this reissue application has also been filed to correct a mistake in the record of this U.S. national stage application. In particular, the English translation of the International Application, which was filed at the time the US National Stage was entered, did not provide a correct English translation of the originally filed claims of the International Application. Instead, the claims of the Article 34 Amendment filed 1 September 2000 with the IPEA were incorrectly indicated to have been the originally filed claims.

Therefore, submitted herewith is an English translation of the originally filed claims 1-15 of International Application No. PCT/EP99/04660 with handwritten changes to correct the original translation. It is confirmed that this erroneous translation was submitted without deceptive intention. Furthermore, these corrected original claims have been submitted merely for the purpose of clarifying the record and do not serve as the basis for examination.

In accordance with Rule 173(c) and MPEP 1453, the status of the claims is:

Claims 1-15 remain pending without amendment.

New claims 16-31 have been added.

In addition, in accordance with Rule 173(c) and MPEP 1453, support for the new claims 16-31 will be provided in the following section. In this identification of support, it is noted that the term "original claim" refers to the enclosed English translation of the originally filed claims 1-15 of International Application No. PCT/EP99/04660. Further, references to the specification have been made with respect to U.S. Patent No. 6,360,719. In addition, the present recitation of support in the patent is provided merely to present exemplary teachings that support the new claims 16-31. This recitation is not intended to identify all support in the patent. Additional support can be identified, if necessary. Furthermore, the claims are not to be interpreted in any manner that would restrict the claim scope to the exemplary support identified herein.

Claim 16: Original claim 11, col. 3, lines 14-19 (the "means for generating signals representative of engine performance demands" may be, e.g., an accelerator pedal, a crankshaft rotational speed sensor, a temperature sensor, etc.), col. 3, lines 35-43 (reduced pressure condition or "vacuum" generated) and col. 5, lines 34-60.

Claim 17: Original claim 14 and col. 3, lines 20-25.

Claim 18: Original claim 14, col. 7, line 43 to col. 8, line 32 and Figure 8.

Claim 19: Original claim 15 and col. 8, lines 11-21.

Claim 20: Original claim 3 and col. 3, lines 11-13.

Claim 21: Original claim 3, col. 3, lines 4-5 and Figure 1.

Claim 22: Original claim 4.

Claim 23: Col. 8, lines 33-67 and Figure 9.

Claim 24: Original claim 1, col. 3, lines 14-19 (the "means for generating signals representative of engine performance demands" may be, e.g., an accelerator pedal, a crankshaft rotational speed sensor, a temperature sensor, etc.), col. 3, lines 35-43 (reduced pressure condition or "vacuum" generated) and col. 5, lines 34-60.

Claim 25: Original claim 14 and col. 3, lines 20-25.

Claim 26: Original claim 14, col. 7, line 43 to col. 8, line 32 and Figure 8.

Claim 27: Original claim 15 and col. 8, lines 11-21.

Claim 28: Original claim 3 and col. 3, lines 11-13.

Claim 29: Original claim 3, col. 3, lines 4-5 and Figure 1.

Claim 30: Original claim 4.

Claim 31: Col. 8, lines 33-67 and Figure 9.

Pursuant to Rule 178 and MPEP 1416, Patentee hereby offers to surrender the original copy of the patent. The original copy will be provided to the PTO at a later time, but before the reissue application is allowed.

Finally, in accordance with MPEP 1412.03, Patentee hereby expressly reserves the right to submit additional broadened claims in this reissue application after March 26, 2004.

Respectfully Submitted,

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Patent Claims

1. A charge control apparatus for a reciprocating internal combustion engine, the reciprocating internal combustion engine having at least one cylinder (4) in which a piston (6) is reciprocably moved by a crankshaft (10), the cylinder having at least one intake opening (16) which is periodically communicated with an intake conduit (14) which terminates thereat, an intake valve (18) which opens and closes the intake opening as a function of the rotation of the crankshaft, at least one outlet opening (20), and an outlet valve (24) which opens and closes the outlet conduit as a function of the rotation of the crankshaft to thereby periodically communicate the cylinder with an outlet conduit (22) extending from the outlet opening, the charge control apparatus characterized by:

a ~~rotary disc~~ valve (28; 60; 62; 278; 272) disposed in the intake conduit (14) and actuated by an electric motor (28; 90; 282; 284) and

a control unit (26) for controlling the electric motor at least as a function of an engine performance demand member (34) to effect movement of the ~~rotary disc~~ valve such that the closing time point of the ~~rotary disc~~ valve is set increasingly ahead of the

closing time point of the intake valve as a function of decreasing performance demands.

2. A charge control device according to claim 1 characterized in that the opening time point of the ~~rotary disc~~ valve is varied in connection with the same maintained closing time point of the intake valve or, respectively, the same maintained cylinder filling amount (air effort) as a function of the rate of rotation of the reciprocating internal combustion engine so as to optimize the charging transition in connection with partial loading.

3. A charge control device according to claim 1 or 2 characterized in that the ~~rotary disc~~ valve (28; 60, 62) includes a rotatable ~~shaft~~ valve member (30; 60) rotatably mounted in a housing (40) ~~which is~~ and directly driven by the motor (32; 90) which is an electric step motor.

4. A charge control device according to claim 4 and characterized in that a torsion stiff and flexible connection coupling (66) is arranged between the rotatable ~~shaft~~ valve member (60) and the electric motor (90).

5. A charge control device according to claim 3 or 4 characterized in that ~~the electric motor includes~~ a magnetic pole rotor ~~the~~ carrier formed, and the rotatable ~~shaft~~ valve member (60) ~~and the electric motor are configured to operate with one another as an electro magnetic rotational unit~~ are formed as a constructive unit of the electric motor.

6. A charge control device according to one of claims 3 - 5

characterized in that the housing (40) ~~includes~~ and a magnetic field winding (formed as a) stator of the electrical motor form a constructive unit.

7. A charge control device according to claim 1 or 2 characterized in that the valve member (274) includes a shaft (276) actuated by the electric motor (282, 284), a separation wall (270) in the intake conduit, and valve openings (272) formed in the separation wall (270), and at least two closure members (278) fixedly disposed on the shaft and each associated with a respective valve opening for opening and closing the respective valve opening in correspondence with movement of the shaft such that the pressure differential acting on the closure members in their closed positions is compensated.

8. A charge control device according to claim 7 and characterized in that the shaft (276) extends transversely through the intake conduit (14) and is longitudinally movable by a magnetic stroke actuator (282, 284) and the closure members (278) are discs which encircle the shaft and which are provided along the serpentine separation wall (270) extending longitudinally in the intake conduit, whereby, with respect to the direction of flow through the intake conduit, the closure members are arranged in the open disposition of the valve on differing sides of the valve

openings.

9. A charge control device according to claim 8 characterized in that four valve openings (272) are provided with associated closure members (278).

10. A charge control device according to one of claims 1 - 9 characterized in that the cylinder includes two intake conduits (46, 48) with associated intake valves, a rotary disc valve (54, 60) is disposed in each intake conduit, and each rotary disc valve is connected to a separate electric motor (90) for independent actuation of the rotary disc valve.

11. A method for controlling the operation of a reciprocating internal combustion engine, (especially a gasoline motor, which) ~~the~~ reciprocating internal combustion engine ~~having~~ has at least one cylinder (4)) in which a piston (6) is reciprocably moved by a crankshaft (10), ~~the~~ which cylinder ~~having~~ has at least one intake opening (16) which is periodically communicated with an intake conduit (14) which terminates thereat and an intake valve (18) which opens and closes the intake opening as a function of the rotation of the crankshaft and having at least one outlet opening (20) and an outlet valve (24) which opens and closes the outlet conduit as a function of the rotation of the crankshaft to thereby periodically communicate the cylinder with

an outlet conduit (22) extending from the outlet opening, whereby an engine performance demand member (34) is provided whose position dictates the amount of fresh air charge introduced through the intake opening, the method characterized by:

controlling the movement of a rotary disc valve (28; 60; 62; 278; 272) disposed in the intake conduit (14) at least as a function of the engine performance demand member (34) to effect movement of the rotary disc valve such that the closing time point of the rotary disc valve is set increasingly ahead of the closing time point of the intake valve (18) as a function of decreasing performance demands and

controlling the movement of the rotary disc valve into its opening position so as to create a pressure wave which moves through the open intake valve into the cylinder.

12. A method for controlling the operation of a reciprocating internal combustion engine (especially a gasoline engine, which), ~~the~~ reciprocating internal combustion engine ~~having~~ has at least one cylinder (4) in which a piston (6) is reciprocably moved by a crankshaft (10), the cylinder ~~having~~ has at least one intake opening (16) which is periodically communicated with an intake conduit (14) which terminates thereat and an intake valve (18) which opens and closes the intake opening as a function of the

We have no changes to the remainder of claim 12 or claims 13-15.